43° 54′, W. 128° 32′, experienced a severe shock of earthquake lasting twenty-five seconds. It made the ship shake as if it had jumped over a coral reef in a heavy swell. Every man on board felt the shake, which seems to have occurred just before dinner time, and everything movable on deck started."

GALE AT BUENOS AYRES.

By cable dispatch on October 31, we learn that a great gale was then raging at Buenos Ayres on the coast of Argentina.

SAND BLIZZARD.

During the 18th, 19th, and 20th of October sand and dust storms, with low temperature and the wind at 50 miles per hour, prevailed over Minnesota, the Dakotas, and Manitoba, and the inconveniences of such a blizzard were intensified by the alkaline character of the dust. Numerous prairie fires occurred in southwestern Minnesota and South Dakota, but especially on either side of the Red River Valley.

DROUGHTS AND CROPS.

An article in the Monthly Review of the Iowa Service states that the average deficiency in rainfall for the whole of the State, from March to September, inclusive, was 3.51, and the total rainfall for the seven months, 21.82, and that, although this has been a droughty season, yet this rainfall was sufficient to—

Bring the most abundant crops harvested in this State for the past twenty years; and this, too, following the worst drought experienced in this State since its early settlement.

The records for the season do not furnish a basis for some of the theories that have been so confidently broached to account for the recent widespread drought. It will be observed that the Lake Region and Atlantic Coast stations suffered more than some of the western sections that have very little timber or water surface.

Evidently the notion that lakes, ponds, marshes, and forests are essential to the production of rainfall is not supported by the records of the current year.

THE DROUGHT AND THE WEATHER IN DISTANT REGIONS.

In connection with the drought of 1895 in the United States, the following items relative to other countries are quoted from newspaper reports:

British Columbia.—The Columbia River is lower than ever before known. The woods bordering on Puget Sound are very dry and suffering from forest fires. In some regions but one or two showers have fallen during July, August, September, and October.

Alaska.—The rain and cloudiness has been about normal during August and September in the southern part of the Territory.

Europe.—A drought has prevailed similar to that in the United States.

Australia.—A very severe drought and great distress during July, August, and September, especially in New South Wales.

Greenland.—The summer of 1895 was the mildest ever known in the neighborhood of Ivigtut. The mountains for the first time ever known were bare of ice and snow. Wild animals accustomed to the extreme cold have been compelled to go farther north. Blueberries were plentiful for the first time in many years. The water about the southern coasts was warm enough to bathe in and apparently not colder than on the Jersey coast. [According to reports brought by the arrival, on October 13, at Philadelphia, Pa., of the bark *Silicon* from Ivigtut.]

By the end of October the United States had realized one of the longest and most extensive droughts on record. The States of West Virginia, Kentucky, southern Ohio, and western Pennsylvania had suffered more than any other region. Rains had fallen sufficiently to secure good crops in a portion of eastern Ohio and portions of Arkansas, Indiana, Iowa and Nebraska, Missouri and Kansas, but in general, throughout the watershed of the Mississippi and its tributaries, the drought of August, September, and October has been very severe. On the Atlantic Coast the total rainfall during this growing season has also been small, but as the crops depend upon the proper distribution of the rain throughout the season, the effect of the drought has not always been so disastrous as it might have been. The general rains of the Middle States and New England interrupted the drought in that region during the third week of October, but did not supply water to the western slopes of the Alleghanies in sufficient quantity to improve the navigation of the Ohio, which, at that time, was little better than a succession of pools. In eastern Pennsylvania the drought was considered as the most severe since 1869. On the 19th Capt. E. P. Chancellor, Supervising Inspector, reported that the Ohio River from Pittsburg to Cincinnati was lower than he had ever known it, and could be waded anywhere above Cincinnati. On the eastern side of the Alleghanies, the Potomac River, and especially the Chesapeake and Ohio Canal, were lower than ever before recorded. At Cumberland, October 11, below the dam, the bed of the river was perfectly dry from shore to shore, and there was not enough depth of water in the intake lock of the canal basin to float an empty boat. Navigation was closed until the water should rise.

At Portsmouth, Ohio, the lowest watermark at the close of October, 1895, was 2 inches below that of 1881, but not yet down to that of 1838. A special correspondent of The Evening Star, writing from Gallipolis, Ohio, November 7, states that over four or five counties in the extreme southern part of Ohio and on occasional trips into West Virginia and Kentucky he found the same condition everywhere. No rainfall since the snows of February; the effects of the drought were already felt in May, and by the first of June farmers were full of fear. Notwithstanding this, both wheat and corn gave good crops, and on the bottom lands crops were of the finest quality. Potatoes, oats, and hay gave light crops, but the apple crop was the best ever known. July, August, and September were exceedingly hot, and up to this time there had not been a single heavy rain that would wet the soil to the depth of an inch. Local showers, of very limited area and short duration, had occurred at rare intervals. People commonly said "the showers have all been going around us all summer; they had a good rain north or south of us, but we had not a drop." Very often the correspondent had a chance to test such reports, and generally found them erroneous; each locality considered itself an exceptional sufferer; but his wider observation showed that there was very little partiality in the distribution of those showers, except that they were a little more frequent and copious near the river. At Uniontown, Ky., the Ohio was so low that it is said that an old vein of coal under the river bed was worked and thousands of bushels taken out daily. Possibly, however, this was a partial error. The coal may have been dug out at Uniontown very much as it was at Milton, Ky., where the wrecks of old coal barges were uncovered and tons of coal taken out by the farmers.

A correspondent of the New York World asks—

What has become of the enormous quantity of water that has evaporated from the United States during this drought which has lasted so long that the Great Lakes have been sensibly lowered and large rivers have shrunk to mere brooks. The water is somewhere in the world, and is in reach of the telegraph and international mail service. There must have been a marked change of rainfall somewhere to correspond with our loss of water; can not the Weather Bureau find what has become of it?

This correspondent starts an interesting question, to which we must reply that it can not be definitely answered unless we have a series of daily maps of the weather, or monthly maps of average conditions for the whole globe. Notwithstanding the activity of modern weather bureaus, we have at present daily and monthly maps of only the United States, Canada, Europe, Algeria, Cape Colony, India, Japan, and Australia. The total area covered by these countries is but a small fraction of the globe, and our maps of the great oceanic areas are only compiled after years of labor in collecting the logs of vessels. If daily maps of the globe were available, we should, undoubtedly, be able to demonstrate that which at present we only have a right to suspect as the

true state of the case. The rainfall that has been withheld from the United States represents but an utterly insignificant fraction of the total quantity of moisture in the atmosphere, and its retention in the air can have but little effect on the phenomena that may have occurred elsewhere. If, as is most probable, the moisture is fairly well distributed throughout the atmosphere, it will not be practicable with our present knowledge to ascertain where that which is withheld from us should descend as rain. In fact, the collection of data relative to weather in distant regions, so far as we have at present progressed, suggests the possibility that droughts have occurred this year in almost all regions from which we have meteorological reports, whence we may conclude that the atmosphere is, on the average, slightly drier than usual, possibly the tenth or the hundredth part of 1 per cent, a conclusion to which, in fact, we were lead by a study of the winds in some editorial remarks on page 337 of the September REVIEW. This conclusion is, in fact, the very opposite of that suggested by our correspondent, whose words imply that there must on the average be the same amount of rainfall annually all over the globe, as a whole, and that, therefore, a diminished rainfall over the United States, together with increased evaporation, necessarily means that the atmosphere has, temporarily, a larger charge of moisture than usual.

If we accept as a working hypothesis the idea that the whole atmosphere can have appreciably less moisture one year than another, we are led then to inquire as to the reason for this. Several reasons may be suggested as equally plausible. The first is purely mechanical, and rests upon the conclusion, which now amounts almost to a demonstration, that the average condition of the atmosphere as a whole may vary from year to year in an irregular way precisely as the annual average condition is known to vary for any given station, and even for large sections of the country. We have no right to assume that the average temperature or moisture, or movement, or pressure of the atmosphere of the whole globe will be the same from year to year any more than that the local station averages will be the same. This is equivalent to recognizing the fact that the atmospheric phenomena do not and can not go through short cycles only, but must necessarily also go through many long cycles, and that none of these are necessarily recurrent. In technical terms we should say that atmospheric phenomena are not a case of steady motion.

A second hypothesis that may be plausibly suggested is that the cause of these irregularities lies outside of the earth, and may be due to the irregularities in the quantities of heat sent to us from the sun from year to year. It has been plausibly argued from the observations of temperature that there is a periodicity in the solar radiation parallel to that of the sun spots, so that the whole atmosphere receives more heat, and consequently must have a little more moisture, and perhaps yield more rains and storms when the sun spots are most numerous. But this hypothesis does not seem to be needed at present.

THE EXTENT OF A LOCAL RAIN.

In continuation of our remarks in the September REVIEW as to the limiting area of what may be called a local storm we append the following table showing the details of the rainfall at Jupiter, Fla., and at Hypoluxo, which is 33 miles south of that station and about the same distance from the seashore. At Jupiter the coast line trends north-northwest and south-southeast, but at Hypoluxo the trend is more nearly north and south. The maximum monthly rainfalls usually occur on this coast in either August or September, but for the present year they have occurred in October, and have been heavier at Jupiter and Hypoluxo than any other region. The following table gives the rainfall, measured daily at 8 a. m. and 8 p. m. at Jupiter, and in the next columns the total rain at each station for the twenty-four hours preceding 8 a. m. of the respective dates. These falls were usually heavier during the twelve hours, 8 p. m. to 8 a. m., than during the daytime; they were almost invariably accompanied by north, east, or northeast winds attending cyclonic disturbances to the eastward. The differences in the 24-hour rainfall up to 8 a. m. of each day, as given in the last columns of this table, show how very local the heavy rainfalls must have been, and how many stations are necessary for the proper presentation of the distribution of heavy rainfall over any country, even a flat and uniform land, like Florida:

Daily Rainfall, October, 1895.

Date.	Jupiter.		8 p.m.+8 a.m. daily.		Date.	Jupiter.		8 p.m.+8 a.m. daily.	
	8 a.m.	8 p.m.	Jupiter.	Hypoluxo.		8 a.m.	8 p.m.	Jupiter.	Hypoluxo.
September 30.	.....	0.10	.....	.....	October 17....	0.54	0.03	0.09	0.99
October 1....	0.10	1.72	0.20	0.72	18....	2.97	1.37	3.00	1.00
2....	T.	T.	1.72	0.12	19....	0.48	0.00	1.85	0.94
3....	0.08	0.06	0.08	0.00	20....	0.01	1.84	0.01	3.45
4....	0.02	0.00	0.08	0.00	21....	2.00	0.90	3.84	4.05
5....	0.00	0.00	0.00	0.00	22....	2.30	0.06	3.20	0.00
6....	0.00	0.00	0.00	0.00	23....	0.00	0.00	0.06	0.00
7....	0.00	0.00	0.00	0.00	24....	0.00	0.00	0.00	0.00
8....	0.00	0.00	0.00	0.00	25....	0.00	0.00	0.00	0.00
9....	0.00	0.21	0.00	1.15	26....	0.00	0.00	0.00	0.00
10....	1.84	0.18	2.05	0.04	27....	0.00	0.00	0.00	0.00
11....	0.00	0.00	0.18	0.00	28....	0.00	T.	0.00	7.50
12....	0.18	0.16	0.18	0.33	29....	T.	0.87	T.	1.33
13....	T.	T.	0.16	0.00	30....	0.03	0.01	0.90	0.00
14 ...	0.00	0.00	0.00	0.00	31....	0.00	0.00	0.01	0.00
15....	1.52	0.82	1.52	1.74					
16....	0.58	0.15	1.40	1.03		12.65	8.38	21.13	24.39

OBSERVATIONS AT HONOLULU.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

August, 1895.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1..	30.00	29.94	29.98	77	82	78	86	77	71	74	7.6	ne.	5-3	8	0.07
2..	29.99	29.94	29.97	78	78	78	78	76	80	79	8.4	ene.	6	10	0.06
3..	30.00	29.95	30.00	78	80	77	81	77	79	77	8.0	ne.	4	10	0.65
4..	30.02	29.95	30.01	77	81	77	84	77	69	70	7.0	ne.	4	8	0.01
5..	30.02	29.97	30.02	76	81	77	84	76	66	71	6.9	ne.	3	3	0.00
6..	30.02	29.97	30.07	75	82	77	85	72	64	74	7.1	ne.	4	3	0.05
7..	30.07	30.00	30.06	76	83	75	85	75	67	80	7.4	ne.	4	3	0.03
8..	30.04	29.97	30.03	76	81	77	82	76	69	70	7.4	ne.	3	4	0.06
9..	30.04	29.98	30.06	75	83	77	85	75	64	70	7.2	ne.	4	4	0.03
10..	30.06	29.99	30.05	74	83	73	86	70	64	74	6.9	ne.	4	4	0.00
11..	30.03	29.96	30.02	75	84	74	85	71	71	74	7.3	ne.	3-0	3	0.00
12..	30.03	29.97	30.00	71	74	76	85	69	67	74	7.2	w-s-e.	1	9-3	0.00
13..	30.02	29.93	29.99	76	82	77	84	74	64	65	6.9	ne.	4	3	0.09
14..	30.00	29.93	30.01	74	82	77	84	72	70	70	6.8	ne.	3	4	0.02
15..	30.00	29.94	30.00	74	82	76	84	72	75	78	7.5	ene.	4	4	0.13
16..	30.04	29.99	30.08	74	82	77	84	74	82	70	7.5	ene.	5	8	0.17
17..	30.09	30.04	30.10	76	82	75	84	76	64	80	7.0	ne.	3	4	0.04
18..	30.11	30.05	30.10	76	80	76	82	73	79	76	7.4	ne.	3	9	0.19
19..	30.10	30.04	30.08	74	79	76	82	73	67	67	6.9	ne.	5	4	0.30
20..	30.10	30.03	30.08	72	75	75	79	71	80	77	7.4	ene.	4	10-7	0.10
21..	30.06	30.00	30.06	74	79	76	82	73	72	74	7.2	ne.	3	5	0.15
22..	30.06	29.99	30.05	72	82	78	84	72	72	75	8.0	ene.	3	5	0.06
23..	30.06	30.00	30.06	72	82	77	85	71	65	74	7.5	ene.	3	4	0.13
24..	30.05	29.97	30.04	75	81	75	84	74	70	77	7.6	nne.	0-4	2	0.01
25..	30.04	29.98	30.04	70	82	76	85	69	69	75	7.7	s-ne.	1-3	2-5	0.11
26..	30.02	29.95	30.02	75	84	75	85	72	65	85	7.5	se-ne.	2	3	0.00
27..	30.01	29.95	30.01	70	83	75	83	70	80	80	8.0	sw-ne.	2	4	0.35
28..	30.02	29.94	30.02	75	84	78	86	71	68	75	7.8	e.	3	4-0	0.06
29..	30.03	29.96	30.04	78	83	78	85	77	68	69	7.4	ene.	3	3	0.00
30..	30.01	29.97	30.04	78	82	77	84	77	68	67	7.1	ne.	3	3	0.00
31..	30.04	29.98	30.04	76	81	78	83	75	65	65	6.7	ne.	4	4	0.00
	30.04	29.97	30.03	74.8	81.2	76.4	83.7	73.4	69.8	74.0	7.6	.....	3.3	4.8	2.87

The monthly summary for August is: Mean temperature, 77.5; the normal is 77.8; extreme temperatures, 86 and 69. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.